

ADDITIONS TO KNOWLEDGE OF THE FOSSIL INVERTEBRATE FAUNA OF CALIFORNIA

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During the spring and summer of 1937 considerable work was done by John Q. and Tom Burch, Mrs. Effie M. Clark, and the writer on an exposure of the Timms Point horizon at San Pedro, California. Several thousand specimens, mostly mollusks, have been recovered and classified, with the result that numerous facts new to our knowledge of Californian fossils have been brought to light. Although the exposure worked must be quite near the ones reported on by Dr. Alex Clark (Trans. S. Diego Soc. Nat. Hist., vol. 7, no. 4, 1931, pp. 25-42), a comparison of his faunal list with ours shows numerous differences between the two. This, of course, is not surprising, as such variation is frequent in our present day fauna, even in nearby localities.

Whether the lower portion of the Timms Point exposure (where our work was done) is Pliocene, as considered by Dr. Ralph Arnold (Mem. Calif. Acad. Sci., vol. 3, 1903), or lower Pleistocene, as Dr. Clark believed, is not discussed here, the purpose of this paper being only to record occurrences that add to our list of fossils, or to extend known ranges of species. Although more than two hundred species of mollusks from this locality are in our collections, only those believed to be of special interest are listed in the following notes.

Pseudochama granti Strong. Numerous specimens taken are identical with topotypes of *granti* from Catalina Island. Whether this is anything more than the young of *P. exogyra* (Conr.) is still a question.

Macoma carlottensis Whiteaves + *M. inflatula* Dall. *Macoma planiuscula* Grant and Gale. These two species, neither of which appears to have been recorded as fossil from California, are both rather common in our material. I have followed Grant and Gale (Mem. S. Diego Soc. Nat. Hist., 1, 1931, p. 372) in considering *M. inflatula* Dall a synonym of *M. carlottensis* Whiteaves.

Panomya turgida Dall. A study of Alaskan specimens of *Panomya* in the writer's collection appears to indicate that there has been a rather general confusion of this species with *P. ampla* Dall. Dr. Dall's illustration of *ampla* (Proc. U. S. Nat. Mus., 24, 1902, pl. 40, figs. 3, 4) certainly does not represent the same shell that Oldroyd (Stanford Univ. Publ. Geol., 1, 1924, pl. 10, fig. 3), and Grant and Gale (op. cit., pl. 21, figs. 10a, 10b) figure as that species. I have not seen the specimens upon which the

records of *ampla* from Deadmans Island (Arnold, op. cit., p. 183), and Timms Point (Clark, op. cit., p. 30) were based. However, examples secured in the latter locality by Mrs. E. M. Clark and John Q. and Tom Burch are not *ampla*, but nearer to, if not identical with, *turgida*, as figured by Dall (U. S. Nat. Mus. Bull., 112, 1921, pl. 2, fig. 1). *Ampla* is very irregular in outline, being broadly truncated at one end and rather pointed at the other, while *turgida* is much more equilateral.

Dentalium rectius Carpenter. Although this species does not appear to have been recorded as a fossil from California, a number of specimens are in our collections.

Lora reticulata (Brown). Numerous specimens taken together with *L. fidicula* (Gould).

Trivia ritteri Raymond. One specimen in the Burch collection. Previously recorded from upper Pliocene at Fifth and Hope streets, Los Angeles, California (Grant and Gale, op. cit., p. 754).

Triphora fossilis, new species. Plate 24. Description: Shell sinistral, elongate-conic, brown. Nuclear whorls decollated. Later turns ornamented by two subequal ridges (one at the summit and the other just above the periphery), which are truncated posteriorly and gently rounded anteriorly. On the eleventh turn a slender cord appears between the two ridges, somewhat nearer the posterior one, and continues to the body whorl, where it is slightly increased in size. The whorls are also marked by axial ribs, weaker than the main spiral ridges, the intersections of the ribs and spirals forming strong tubercles. There are about 16 tubercles on the early whorls and about 22 on the last two. Sutures moderate, showing little trace of peripheral keel, even on the penultimate whorl. Periphery of last turn marked by keel which is crossed by the axial ribs. Base decorated by two slightly rounded spiral cords, the first of which is just below the peripheral keel and the second on the columella. Aperture (somewhat broken) oval, strongly channeled anteriorly.

The type, No. 1053 Los Angeles Museum, has 14 whorls and measures 8.3 by 2.1 millimeters. The type, together with another specimen, was collected by G. Willett in the lower part of the Timms Point formation, San Pedro, California, summer of 1937. There is also a specimen in the collection of Mrs. E. M. Clark.

This species differs from *Triphora carpenteri* Bartsch in less strongly channeled sutures and in the very weak median cord, which only appears on the later whorls. It is larger than *T. hemphilli* Bartsch, and the median cord appears much later than in that species. A few specimens of *T. pedroana* Bartsch were taken in the same deposit.

Barleeia oldroydi Bartsch. Twenty-five specimens taken by the writer.

Natica russa Gould. As Grant and Gale have pointed out (op. cit., p. 798), this species has frequently been confused with *N. clausa* Broderip and Sowerby. All the *Naticas* found by us at Timms Point (20 in Los Angeles Museum) are referable to *russa* rather than *clausa*. Not only do they have the larger callus plug of the former, but they still show much of the brown coloration. *N. clausa* is much lighter in color, varying from cream to olive. This is the first definite fossil record for *russa* in California, but many records of *clausa* probably belong here.

Velutina laevigata (Linnaeus). One specimen collected by the writer.

Acmaea funiculata Carpenter. Although I have not seen recent specimens showing intergradation between this species and *A. mitra* Eschscholtz, there appear to be such among our fossils. Of six specimens from Timms Point in the Los Angeles Museum, one is typical *mitra*, two are *funiculata*, and the other three are intermediates.

Leptothyra subobsoleta, new species. Plate 25. Description: Shell small, globose, imperforate; about three and one-half rounded whorls, a more or less obscure keel running around the base from the insertion of the outer lip. Under a lens there are very faintly indicated spiral striations. Aperture (more than half the length of the shell) rounded-oval with vertical axis slightly longer than horizontal one. Columella grooved anteriorly, not denticulate; columellar callus barely covering umbilicus. Color of shell light brown (probably darker in life) with an irregular lighter area around the closed umbilicus.

The type, No. 1054 Los Angeles Museum, measures: alt., 3; diam., 2.8 millimeters. Paratypes in Burch and Clark collections. The type and 30 additional specimens were taken by G. Willett in the lower Timms Point formation, San Pedro, California, summer of 1937.

This species differs from *L. bacula* Carpenter in much smaller size, smoother whorls, and lack of columellar teeth. It appears nearest to *L. engbergi* Willett (*Nautilus*, 43, 1929, p. 27), from Olga, Washington, but differs from that species in much fainter striations, less rounded (slightly carinated) body whorl, and in light colored zone around umbilical region.

Solariella varicosa Mighels and Adams. Five specimens taken by the writer appear referable to this species, though, judging from their small size, none is adult.

Vitrinella stearnsi Bartsch. One specimen in the Burch collection.

Puncturella cooperi Dall. It is strange that neither Arnold nor Clark have recorded this species from the San Pedro deposits, as it was found to be abundant in the lower part of the section we worked. Several hundred specimens are preserved in the Los Angeles Museum and others in the Burch and Mrs. E. M. Clark collections. *P. cucullata* (Gould) was considerably less plentiful, and only three specimens of *P. galeata* (Gould) were found.

Puncturella delosi Arnold. Three specimens of this species, previously known only from the Santa Barbara Pliocene, were secured by the writer. Dr. Dall's unfigured Recent species, *P. carophylla* (Nautilus, 28, 1914, p. 63), should be compared with this.

Epitonium catalinae Dall. *Epitonium sawinae* Dall. A few specimens of each of these two *Epitoniums* were found.

Ischnochiton trifidus Carpenter. One tail valve in Burch collection.

Mopalia imporcata Carpenter. Three head valves and two median valvelets in Museum collection.



PLATE 25

Leptothyra subobsoleta Willett.

Type, enlarged x 3½.